Original Research Article

Assessment of Health Literacy Level among Clients Attending King Salman Armed Forces Hospital, Tabuk

Wejdan Saad Alqahtani[1*], Hayfa Oudah Albalawi[1], Abdullah Saeed Alzahrani[2], Dr. Tareq Shaqran[3]

[1]RNI in Station 25, KSAFH, Tabuk, Saudi Arabia
[2]Specialist Nurse in KSAFH, Tabuk, Saudi Arabia
[3]Director of Health Education Department, Tabuk, Saudi Arabia

*Corresponding author: Wejdan Saad Alqahtani
RNI in Station 25, KSAFH, Tabuk, Saudi Arabia

Abstract

A cross sectional study will be done among a convenience sample of clients attending surgical, medical out-patient clinics of King Salman Armed Forces hospital (KSAFH) in Tabuk city. A pretested structured questionnaire will be utilized in data collection included demographic characteristics and HLS-Q12 Arabic version after its validation.
Keywords: demographic characteristics, Health Literacy, HLS-Q12, cancer screening.

BACKGROUND

Reviewing of literature for similar studies revealed some Saudi studies, the following is briefing of the most relevant and recent studies. From the 13 provenance regions in kingdom of Saudi Arabia, health literacy (HL) research results show diversity. In JEDAH, 2010 health literacy research published in kingdom of Saudi Arabia, which was the 1st of its kind, 82% of participant were adequate in health literacy, female participants show higher HL score then male participants. In Riyadh, 2018 research shows 84.4% of participant with adequate health literacy, while SILS survey - which is self-report survey that measured reading skill to health related information- survey shows half of the participants has limited HL. Earlier in 2015, the research result done among 105 of female participate shows that the majority has adequate health literacy. A particular health literacy research regarding colorectal cancer screening show that finding indicates that majority of the participants have low health literacy and less awareness about colorectal cancer screening. In Medina 2017, research conducted as a cross sectional study regarding health literacy in Saudi Arabia, result highest percentage 43.8% was participant with intermediate health literacy. In 2019 a descriptive analysis of 3557 participants presented for 13 region of Saudi Arabia, result reveal that 46% has low HL and 30.3% has inadequate HL. Result in this research shows the Najran region, the formerly married, those with less than a high school education, those in lower income groups, and moderate users of healthcare were at higher risk for low HL. Regarding Tabuk region 267 participate in the research, 153 of them (8%) with adequate health literacy level [19]. The following is briefing of the most relevant and recent studies.

INTRODUCTION

In recent statics done 2017, Tabuk population shows that 93% of adult are literate, 93% Population (15 years and above) who assessed their own health status as good or very good, Tabuk register average Individuals' Outpatient Clinic Visits during the 12 Months of 3.1 visit which increases in 2018 to 3.3 visit, which was the highest rate among other administrative region, 19% of Tabuk population do Periodic Medical Examination annually that increase in 23.2% in 2018. By number of eating fruits and vegetables servings per day, its show that 10% of Tabuk population take efficient fruit and vegetables, which the indicator helps to understand the lifestyle of individuals in Saudi Arabia regarding their sufficient intake of vegetable and fruit Tabuk. Percentage of who exercise for 2 hour and 30 minutes and more per week her in Tabuk is 20% of total population, only 10% percent of female actively practice sport [1].

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Health literacy is defined as "the extent to which people have the ability to understand the basic health information needed to make suitable health decisions" [2]. There is a strong relation between general literacy and health literacy. However, health literacy also refers more particularly to healthcare information [2].

Health literacy is a fundamental determinant for health status and compliance with medications [3-5]. Scope of health literacy include many types such as use of medications, awareness of the proper utilization of emergency department, familiarity with oral care instructions, and advice-seeking and decision-making in medical field [6-9].

Sufficient level of health literacy in a community is essential for many reasons including firstly the fact that people with low health literacy often receive low-quality care and are usually have poorer health as it has been documented that in order to put the patient in an active role regarding health-related decision needs educating him enough to be able to receive, interpret any health information that will help in changing his health-behaviors [10]. Second, people with low health literacy are most likely overusing the healthcare system and less use of preventive measures and had higher rate of hospitalization [11, 12].

In the Kingdom of Saudi Arabia (KSA), vision 2030 strategy plan encourage independent businesses to support governmental healthcare infrastructures [6]. Also, the vision 2030 strategy will improve and expand healthcare to meet the needs of the population in urban and rural areas of the Kingdom. Including private sector health insurance [13].

Despite this improvement in the healthcare system, persons with low health literacy are still at higher risk for lack of access to healthcare facilities and more subjected to morbidity and mortality [14]. Therefore, it is especially important to look for people with low health literacy in KSA at national level as higher level of education and income are not necessarily protect people from the negative impacts of low health literacy [14].

Project Objectives
The purpose of this descriptive study is to assess health literacy and factor influencing it for the client visiting outpatient clinic at king Salman armed forces hospital (KSAFH) in Tabuk city, thus will reveal the health literacy level among Tabuk population, and the influencing factor affecting HL. Objectives are:
1. To assess health literacy level among clients attending outpatient clinics-KSAFH, Tabuk city
2. To identify the factor related to health literacy level among clients attending outpatient clinics-KSAFH, Tabuk city

Study Design
A cross sectional study design will be conduct in Tabuk City, KSA which is located 2200 feet above sea level and has moderate climate in comparison with other Saudi cities climate. It has a population of 970,694 (2015 census) [20]. In Tabuk, there is KSAFH, where the study will be conducted specifically.

Setting
Client attending of the surgical & medical outpatient clinics, KSAFH, Tabuk.

Duration:
The client included in the study interviewed throughout the period of September 1st , 2021-30st November 2021.

Sample size:
The sample size was calculated using the Cochran's formula for estimating sample size equation as follows:

$$N = \frac{Z\alpha/22 \times p\,(1-p)}{D^2}$$

Where:
n=Minimum sample size
Zα/2: the critical value of the Normal distribution at α/2 (e.g., for a confidence level of 95%, α is 0.05 and the critical value is 1.96)
P: Prevalence of the outcome of interest (inadequate health literacy 46%, based on a recent Saudi study conducted among general population in all Saudi Regions [13].
D: Degree of precision

So, the calculated minimum sample size was:

$$n = \frac{(1.96)2 \times 0.46 \times 0.54 = 382}{(0.05)^2}$$

The sample will be increased by approximately 10% to compensate for possible none or incomplete response, thus it was 420 clients.

Sampling technique
Non-probability convenience sampling technique will be adopted to select the required sample size from attendees of outpatient clinics, KSAFH, Tabuk.

Sample selection:
Adult clients attending the surgical & medical outpatient clinics at KSAFH**, Tabuk.**

Inclusion criteria
- Saudi nationals
- Age above 18 years
- Willing to participate in the study

- Client visiting an outpatient client in KSAFH

Exclusion Criteria
- Non-Saudi nationals
- Aged 18 years or below.

- Mentally disable clients, who cannot sign an informed consent
- Health-care providers
- Students in Health-related colleges.

Work schedule:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Conceptual Phase																		
Problem identification	■																	
Literature review		■																
Clinical fieldwork	■																	
heoretical framework	■																	
Hypothesis formulation	■																	
Design/Planning Phase																		
Research design			■															
Population specification			■															
Sampling plan		■																
Data collection plan			■															
Ethics procedures		■																
Finalization of plans					■													
Empirical Phase																		
Collection of data									■									
Data preparation								■										
Analytic Phase																		
Data analysis												■						
interpretation of results												■						
Dissemination Phase															■			
Presentations/reports															■			
Utilization of findings															■			

Data collection tool:

A self-administered questionnaire will be adopted in this study where the research team will ask the selected clients to fill in an Arabic pre-tested, structured questionnaire. The questionnaire consisted of two parts:

- Demographic and personal characteristics: Age, gender, occupation, income, educational level, marital status, subjective health status, history of chronic diseases and smoking status.
- Health Literacy Scale-12 (HLS-Q12).24 It is a 12 statements scale with responses ranged between very difficult to very easy. Each statement scored from 1 to 4. Thus, the total score ranged between 12 and 48. It is based on the European Health Literacy Survey Questionnaire (HLS-EU-Q47; HLS-EU Consortium, 2012).25 four levels will be identified regarding health literacy; illiteracy (score<27), marginal (score between 27 and less than 33), intermediate (score between 33 and less than 39) and advanced (score of 39 and over) [15].

The original version of the HLS-Q12 is in English. It will be translated into Arabic and then back translated by English-Arabic professional translators and the Arabic version will be subjected to both content validity by experts, reliability using test-retest reliability and internal consistency using Cronback alpha test

Pilot study:

Pilot study will be conducted 30 volunteers to test the questionnaire applicability and understanding before starting the actual research. Questionnaire and methodology will be tested, and necessary modifications will be made accordingly. The data from pilot study will be included in the main study if there will be no significant changes made.

Ethical Consideration:

- Approval of the research proposal by the local ethics committee will be obtained before conducting the study.
- Written permission from the medical director of KSAFH will be requested.
- Permission to use the questionnaire will be requested through an e-mail communication with the corresponding author of the research.
- Permission of participants will be taken at the beginning of the study.
- All information will be kept confidential and will not accessed except for the purpose of the scientific research.
- Ethical considerations will be taken through all the researcher steps.

Data entry and analysis:

- All collected data will be coded before its entry to a personal computer.
- Data entry and analysis will be done by using the Statistical Package of the Social Sciences (SPSS) statistical program version 27.
- P-value of less than 0.05 will be considered as a level for significance throughout the study.
- Chi-square test and Fischer exact test will be used to test for the association between categorical variables.

Other analytical statistical tests will be applied whenever appropriate to fulfil the study objectives.

Analysis/ Interpretation

A. Demographic & personal characteristics:

Table-1 describes the demographic and general characteristics of population. Age of patients ranges between 18 to >50 years. Among patients 204(47.2%) belong to age group 18-35 years, 140(32.4%) belong to 36-50 years of age group and 88(20.4%) patients were >50 years. In this study 131(30.3%) patients were male and 301(69.7%) were female. Occupational status of these patients showed that 39(9%) were student, 109(25%) were employed, 232(53.7%) were unemployed and 53(12.3%) were retired. There were 305(70.6%) study participants who reported that their income was <5000 SAR, 63(14.6%) reported that their income was in between 5000-10000 SAR and 64(14.8%) reported that their income was in between 10000-15000 SAR. Educational status of study participants showed that 29(6.7%) had education >Intermediate, 106(24.5%) had Primary-Inter education, 163(37.7%) had Secondary School/ Diploma and 134(31%) had College/ postgraduate education. Among these patients 102(23.6%) reported that they were never married, 302(69.9%) were currently married, 13(3%) were divorced and 15(3.5%) were widowed. Among these patients 170(39.4%) had history of chronic illness, 91(21.1%) patients said that they need a companion whenever they had an appointment in hospital. As per body mass index criteria 17(3.9%) patients were underweight, 133(30.8%) had normal BMI, 134(31%) were overweight and 148(34.3%) were obese. There were 193(44.7%) patients who told that their subjective health is excellent, 125(28.9%) reported that they had very good subjective health, 97(22.5%) told that they had good, 14(3.2%) had fair and only 3(0.7%) patients reported that they had poor subjective health. Among these patients 269(85.4%) were non-smokers while 25(8.1%) were current smokers and 28(6.5%) were ex-smokers. Only 211(48.8%) patients reported that they do sports activity for 2 hour and 30 minutes per week. Among these patients 265(61.3%) reported that they eat less than handful vegetables serving, 150(34.7%) reported that they use one handful vegetable servings and only 17(3.9%) patients reported that they used two handful serving of vegetables. Only 193(44.7%) patients reported that they had annually periodic health examination.

Table-1: Characteristics of Study Population (n=432)

	Frequency	*Percent*
Age		
18-35	204	47.2%
36-50	140	32.4%
>50	88	20.4%
Gender		
Male	131	30.3%
Female	301	69.7%
Occupation		
Student	39	9.0%
Employee	108	25.0%
Unemployed	232	53.7%
Retired	53	12.3%
Income		
<5000 SR	305	70.6%
5000-10000 SR	63	14.6%
10000-15000 SR	64	14.8%
Education		
> Intermediate	29	6.7%
Primary-Inter	106	24.5%
Secondary School/Diploma	163	37.7%
College/ Postgraduate	134	31%
Marital Status		
Never married	102	23.6%
Current married	302	69.9%
Divorced	13	3.0%
Widowed	15	3.5%
History of Chronic Illness		
Yes	170	39.4%
No	262	60.6%
Need a companion whenever you have appointment		
Yes	91	21.1%
No	341	78.9%
Body Mass Index	27.76±6.07 [14.30-48.80]	
Underweight	17(3.9%)	
Normal	133(30.8%)	
Overweight	134(31%)	
Obese	148(34.3%)	
Subjective Health Status		
Excellent	193	44.7%
Very Good	125	28.9%
Good	97	22.5%
Fair	14	3.2%
Poor	3	0.7%
Smoking		
Non-Smoker	369	85.4%
Current Smoker	35	8.1%
Ex-Smoker	28	6.5%
Sports activity for 2 hour and 30 minutes/week?		
Yes	211	48.8%
No	221	51.2%
Eating fruits and vegetables servings per day		
Less than handful vegetables	265	61.3%
One handful vegetables	150	34.7%
Two handful vegetables	17	3.9%
Annually having a periodic health examination		
Yes	193	44.7%
No	239	55.3%

B. Health literacy Scale-12 (HLS-Q12)

Table-2: Health literacy Scale-12 (HLS-Q12)

	Frequency	*Percent*
Illiteracy (<27)	49	11.3%
Marginal (27-33)	123	28.5%
Intermediate (33-39)	161	37.3%
Advanced (>39)	99	22.9%
Total	*432*	*100%*
HLS-Q12 Score	33.77±5.89 [Min:17, Max: 48]	

Mean health literacy score was 33.75±5.89. Minimum and maximum score was 17 and 48 respectively. As per health literacy score criteria 49(11.3%) patients were illiterate (<27), 123(28.5%) were having marginal health literacy (27-33 Score), 161(37.3%) were having intermediate health literacy and 99(22.9%) were having advanced health literacy score (>39).
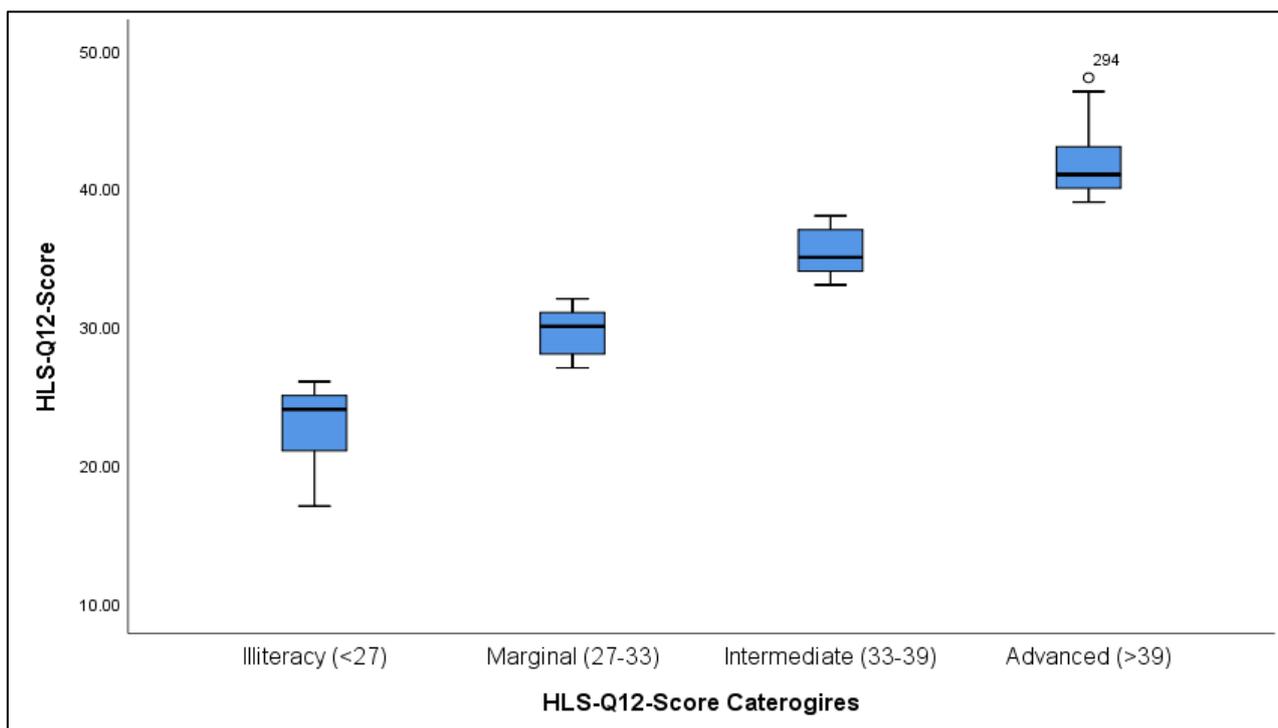

Figure-I: Boxplot for HLS-Q12-Score

Table-2: Association of Health Literacy level with Patients Characteristics

HLS-Q12 Score	Illiteracy	Marginal	Intermediate	Advanced	p-value
n	49	123	161	99	
Age					
18-35	18(36.7%)	60(48.8%)	81(50.3%)	45(45.5%)	*0.211*
36-50	14(28.6%)	39(31.7%)	50(31.1%)	37(37.4%)	
>50	17(34.7%)	24(19.5%)	30(18.6%)	17(17.2%)	
Gender					
Male	15(30.6%)	44(35.8%)	41(25.5%)	31(31.3%)	*0.311*
Female	34(69.4%)	79(64.2%)	120(74.5%)	68(68.7%)	
Occupation					
Student	4(8.2%)	9(7.3%)	17(10.6%)	9(9.1%)	*0.111*
Employee	7(14.3%)	26(21.1%)	39(24.2%)	36(36.4%)	
Unemployed	33(67.3%)	72(58.5%)	86(53.4%)	41(41.4%)	
Retired	5(10.2%)	16(13%)	19(11.8%)	13(13.1%)	
Income					
<5000	41(83.7%)	93(75.6%)	111(68.9%)	60(60.6%)	*0.055*

5000-10000	6(12.2%)	16(13%)	23(14.3%)	18(18.2%)	
10000-15000	2(4.1%)	14(11.4%)	27(16.8%)	21(21.2%)	
Education					
> Intermediate	15(30.6%)	6(4.9%)	6(3.7%)	2(2%)	***<0.001***
Primary-Inter	13(26.5%)	40(32.5%)	37(23%)	16(16.2%)	
Secondary School/Diploma	14(28.6%)	43(35%)	64(39.8%)	42(42.4%)	
College/ Postgraduate	7(14.3%)	34(27.6%)	54(33.5%)	39(39.4%)	
Marital Status					
Never married	11(22.4%)	26(21.1%)	40(24.8%)	25(25.3%)	***0.816***
Current married	34(69.4%)	90(73.2%)	110(68.3%)	68(68.7%)	
Divorced	2(4.1%)	1(0.8%)	7(4.3%)	3(3%)	
Widowed	2(4.1%)	6(4.9%)	4(2.5%)	3(3%)	
History of Chronic Illness					
Yes	25(51%)	50(40.7%)	59(36.6%)	36(36.4%)	***0.290***
No	24(49%)	73(59.3%)	102(63.4%)	63(63.6%)	
Need a companion whenever you have appointment					
Yes	26(53.1%)	34(27.6%)	23(14.3%)	8(8.1%)	***<0.001***
No	23(46.9%)	89(72.4%)	138(85.7%)	91(91.9%)	
Subjective Health Status					
Excellent	14(28.6%)	59(48%)	76(47.2%)	44(44.4%)	***0.021***
Very Good	13(26.5%)	27(22%)	46(28.6%)	39(39.4%)	
Good	19(38.8%)	29(23.6%)	34(21.1%)	15(15.2%)	
Fair	2(4.1%)	7(5.7%)	4(2.5%)	1(1%)	
Poor	1(2%)	1(0.8%)	1(0.6%)	0(0%)	
Smoking					
Non-Smoker	44(89.8%)	109(88.6%)	134(83.2%)	82(82.8%)	***0.347***
Current Smoker	4(8.2%)	10(8.1%)	14(8.7%)	7(7.1%)	
Ex-Smoker	1(2%)	4(3.3%)	13(8.1%)	10(10.1%)	
Sports activity for 2 hour and 30 minutes/week?					
Yes	16(32.7%)	59(48%)	76(47.2%)	60(60.6%)	***0.013***
No	33(67.3%)	64(52%)	85(52.8%)	39(39.4%)	
Eating fruits and vegetables servings per day					
Less than handful vegetables	43(87.8%)	83(67.5%)	89(55.3%)	50(50.5%)	***<0.001***
One handful vegetables	6(12.2%)	37(30.1%)	65(40.4%)	42(42.4%)	
Two handful vegetables	0(0%)	3(2.4%)	7(4.3%)	7(7.1%)	
Annually having a periodic health examination					
Yes	20(40.8%)	49(39.8%)	76(47.2%)	48(48.5%)	***0.483***
No	29(59.2%)	74(60.2%)	85(52.8%)	51(51.5%)	
Body Mass Index					
Underweight	4(8.2%)	6(4.9%)	6(3.7%)	1(1%)	***0.503***
Normal	16(32.7%)	43(35%)	42(26.1%)	32(32.3%)	
Overweight	13(26.5%)	35(28.5%)	53(32.9%)	33(33.3%)	
Obese	16(32.7%)	39(31.7%)	60(37.3%)	33(33.3%)	

Table-2 presents association between healthy literacy level with demographic and personal characteristics of study participants. Income, Educational status, need of companion coming for appointment, subjective health status, sport activity and eating fruits and vegetables were significantly associated with healthy literacy level of study participants. Health literacy rate was higher among participants with income level <5000 as compared to other income levels. It was observed that health literacy rate was higher among study participants who were having Secondary school/Diploma and College/ Postgraduate education. It was also observed that people with higher health literacy level did not need any companions with them during their appointment in hospital. Patients with intermediate and advanced health literacy level had good subjective health status. Sporting activity was higher among study participants with intermediate and advanced health literacy. It was also observed that people with intermediate and advanced health literacy level they had higher frequency for eating less than handful vegetables and fruits.

Table-3: Predictors of Health Literacy

	HLS-Q12 Score			
	Illiteracy (n=49)	*Marginal (n=123)*	*Intermediate (n=161)*	*Advanced (n=99)*
	Odds Ratio (CI-95%)	*Odds Ratio (CI-95%)*	*Odds Ratio (CI-95%)*	*Odds Ratio (CI-95%)*
Age				
18-35	0.400* (0.168-0.951)	0.944(0.454-1.963)	1.020 (0.508-2.049)	Reference Category
36-50	0.378* (0.152-0.941)	0.747 (0.347-1.608)	0.766 (0.369-1.591)	
>50	-	-	-	
Gender				
Male	0.968(0.461-2.031)	1.22(0.696-2.144)	0.794(0.431-1.303)	Reference Category
Female	-	-	-	
Occupation				
Student	1.156(0.241-5.530)	0.812(0.250-2.64)	1.292(0.442-3.778)	Reference Category
Employee	0.506(0.136-1.876)	0.587(0.241-1.42)	0.741(0.321-1.714)	
Unemployed	2.093(0.677-6.470)	1.427(0.625-3.26)	1.435(0.646-3.186)	
Retired	-	-	-	
Income				
<5000	7.717*(1.595-32.27)	2.325(1.09-4.92)	1.439(0.750-2.75)	Reference Category
5000-10000	3.500*(0.62-19.54)	1.333(0.513-3.463)	0.994(0.429-2.302)	
10000-15000	-	-	-	
Education				
> Intermediate	41.786*(7.78-224.31)	3.441(0.65-18.19)	2.167(0.415-11.31)	Reference Category
Primary-Inter	4.527*(1.52-13.43)	2.868*(1.36-6.01)	1.670(0.81-3.42)	
Secondary School/Diploma	1.857(0.67-5.08)	1.174(0.628-2.197)	1.101(0.624-1.940)	
College/ Postgraduate	-	-	-	
Marital Status				
Never married	0.660(0.096-4.52)	0.520(0.117-2.30)	1.200(0.248-5.815)	Reference Category
Current married	0.750(0.120-4.70)	0.662(0.160-2.74)	1.213(0.263-5.58)	
Divorced	1.000(0.08-12.55)	0.167(0.012-2.36)	1.750(0.233-13.15)	
Widowed	-	-	-	
History of Chronic Illness				
Yes	1.823(0.91-3.64)	1.199(0.69-2.06)	1.012(0.60-1.70)	Reference Category
No	-	-	-	
Need a companion whenever you have appointment				
Yes	12.859* (5.15-32.10)	4.346*(1.90-9.90)	1.896(0.81-4.42)	Reference Category
No	-	-	-	
Smoking				
Non-Smoker	5.366(0.66-43.29)	3.323*(1.00-10.97)	1.257(0.52-2.99)	Reference Category
Current Smoker	5.714(0.52-62.65)	3.571(0.79-16.15)	1.538(0.45-5.24)	
Ex-Smoker	-	-	-	
Sports activity for 2 hour and 30 minutes/week?				
Yes	0.315*(0.15-0.648)	0.599(0.35-1.02)	0.581(0.35-0.96)	Reference Category
No	-	-	-	
Annually having a periodic health examination				
Yes	0.733(0.36-1.46)	0.704(0.41-1.20)	0.950(0.57-1.56)	Reference Category
No	-	-	-	
Body Mass Index				
Underweight	8.250(0.85-79.95)	5.077(0.58-44.33)	3.300(0.381-28.59)	Reference Category
Normal	1.031(0.44-2.40)	1.137(0.59-2.18)	0.722(0.386-1.350)	
Overweight	0.813(0.33-1.95)	0.897(0.46-1.74)	0.883(0.48-1.62)	
Obese	-	-	-	

Note: p-value<0.05

In Table-3 various predictors of HLS-Q12 score presented. Age groups 18-35 years and 36-50 years were significant predictors for illiteracy. Similar low-income groups <5000 and 5000-10000 were also significant predictor of health illiteracy. Low educational status i.e., >Intermediate and Primary to Inter education was also significant predictor for health illiteracy and Primary to inter education was also predictor of marginal health literacy. Need of a companion in case of appointment was also significantly associated with illiteracy and marginal health literacy. Being nonsmoker also puts a person 3.323 times at risk of having marginal health literacy. Having sports activity for 2.5 hours is also a significant predictor for a person to have health illiteracy.

DISCUSSION

It is essential for many reasons, to have a high level of population`s health literacy (HL). The first reason is the fact that patients with low health literacy usually receive inadequate care and more susceptible to poor disease and medication literacy and as a result having poorer health and more liable to hospital readmission compared to their peers with high health literacy [21]. The second reason is the fact that patients with low health literacy are more overusing resources of the healthcare system [22, 11] and complicate the supply of healthcare at the population level [11]. Therefore, measuring the health literacy levels in populations is essential, and it is the main aim of the present study among clients attending outpatient clinics of a tertiary care military hospital in Tabuk city, Saudi Arabia.

The present study revealed that 11.3% of patients were health illiterate, 28.5% were having marginal health literacy, and 37.3% were having intermediate health literacy while 22.9% were having advanced health literacy score. In a recent Saudi study, results revealed that 46% of Saudi population had low HL and 30.3% had inadequate HL [14]. In Jeddah (2017), 83.9% of participants had adequate health literacy [17]. In another recent Saudi population-based study, 46% of the Saudi Arabia residents had low health literacy and 30.3% has inadequate health literacy [24]. In Medina (2019), 43.8% of the participants had intermediate health literacy and 34.4% had basic health literacy [16]. Internationally, in Taiwan, the level of HL was 34.4 concerning the general health literacy [12]. while in Iraq, the level of inadequate HL was 30.3% [25]. Comparison between the aforementioned studies, including the present one should be interpreted in the light of using different tools to assess health literacy as well as variations in the socio-demographic characteristics of the participants.

The present study revealed that health literacy rate was higher among more educated participants. This finding is logic and expected finding and confirmed by other investigators [14, 24, 25].

In this study and in accordance with findings of other studies [22, 14] low-income groups were more likely to have health illiteracy.

Multivariate logistic regression analysis of the present study revealed that participants in the age groups 18-35 years and 36-50 years were significant predictors for health illiteracy. In another Saudi study done by Alkhaldi *et al.*, (2018) [24], the younger participants (18-40 years) had significantly higher health literacy level than elder age participants (40 years and above). This discrepancy between the two studies could be attributed to using different tools in assessing health literacy as the present study depended more on self-reports than on an objective assessment of participant actual ability, which is the case in the Alkhaldi`s study.

In the current study, need of companion coming for appointment, subjective health status, sport activity and eating fruits and vegetables were significantly associated with healthy literacy level of study participants. This association between better health perception and behavior from one side and good health literacy from the other side was also confirmed by others [26, 27].

In the present survey, no gender difference was reported regarding health literacy. The same has been reported by others in Saudi Arabia [14, 24].

The present study has some limitations that should be mentioned. First of all, the study was carried out in one healthcare facility in Tabuk city, which could affect our ability to generalize this study`s findings over other facilities as well as cities in the Kingdom of Saudi Arabia. Second, being a cross-sectional study, so we could not explore the temporal relationship between the independent and dependent variables. Finally, using a self-administrative tool is subjected to bias. However, we applied an Arabic validated version of Health Literacy Scale-12 (HLS-Q12) in the present study. Despite those limitations, the study is of public health importance in exploring health literacy among our people and its associates.

In conclusion, most of our population had between marginal and advanced health literacy. People aged between 18 and 50 years were more illiterate. Those with low income and low educational status were also more prone to health illiteracy. Those needed of a companion in case of appointment were more illiterate and those having sports activity were more likely to have health literacy. We recommended conduction of health educational activities for patients in outpatient clinics to improve their health literacy in particular the vulnerable groups. Also, further studies including people from other healthcare facilities and other cities in the Kingdom of Saudi Arabia are warranted.

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Utilization

Client Health literacy can help in implementing the patient centered care strategy goal by allowing persons to share knowledge and experience is and actively involving in deciding the kind of care appropriate for him which will facilitate applying specific care plan appropriate for person condition.

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